

ABSTRACT OF THE DISCLOSURE

The invention includes methods of forming a metallic coating on a substrate which contains silicon. A metallic glass layer is formed over a silicon surface of the substrate. The invention includes methods of protecting a silicon substrate. The substrate is provided within a deposition chamber along with a deposition target. Material from the deposition target is deposited over at least a portion of the silicon substrate to form a protective layer or structure which contains metallic glass. The metallic glass comprises iron and one or more of B, Si, P and C. The invention includes structures which have a substrate containing silicon and a metallic layer over the substrate. The metallic layer contains less than or equal to about 2 weight % carbon and has a hardness of at least 9.2 GPa. The metallic layer can have an amorphous microstructure or can be devitrified to have a nanocrystalline microstructure.